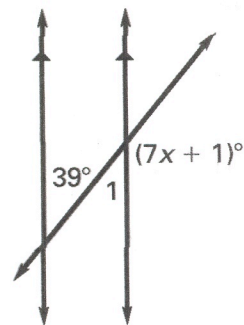


**Example 3**
**Using Properties of Parallel Lines**

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Use properties of parallel lines to find the value of  $x$ .


**Solution**

$$m\angle 1 = \underline{\hspace{1cm}}^\circ$$

$$m\angle 1 + (7x + 1)^\circ = \underline{\hspace{1cm}}^\circ$$

$$\underline{\hspace{1cm}}^\circ + (7x + 1)^\circ = \underline{\hspace{1cm}}^\circ$$

$$7x = \underline{\hspace{1cm}}$$

$$x = \underline{\hspace{1cm}}$$

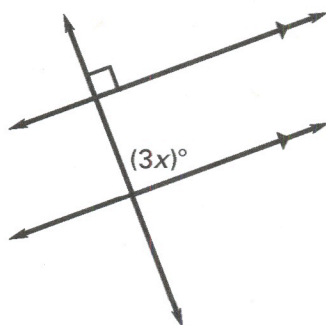
**Substitute.**

**Subtract.**

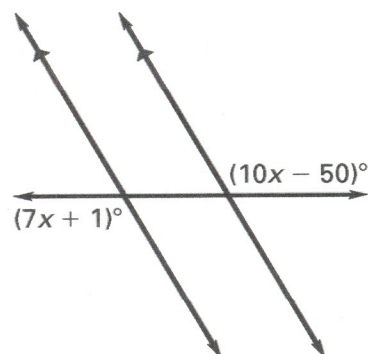
**Divide.**

✓ **Checkpoint** Use properties of parallel lines to find the value of  $x$ .

4.



5.



# Transversals and Corresponding Angles

DATE

PERIOD

If two parallel lines are cut by a transversal, then the following pairs of angles are congruent.

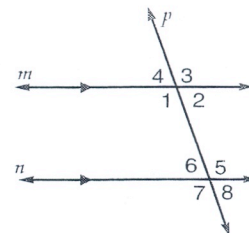
corresponding angles  
alternate interior angles  
alternate exterior angles

If two parallel lines are cut by a transversal, then consecutive interior angles are supplementary.

**Example:** In the figure  $m \parallel n$  and  $p$  is a transversal. If  $m\angle 2 = 35$ , find the measures of the remaining angles.

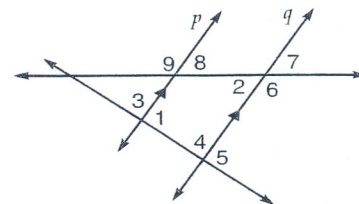
Since  $m\angle 2 = 35$ ,  $m\angle 8 = 35$  (corresponding angles).  
Since  $m\angle 2 = 35$ ,  $m\angle 6 = 35$  (alternate interior angles).  
Since  $m\angle 8 = 35$ ,  $m\angle 4 = 35$  (alternate exterior angles).

$m\angle 2 + m\angle 5 = 180$ . Since consecutive interior angles are supplementary,  $m\angle 5 = 145$ , which implies that  $m\angle 3$ ,  $m\angle 7$ , and  $m\angle 1$  equal 145.

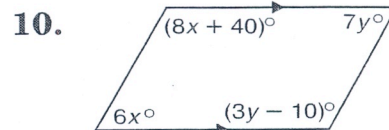
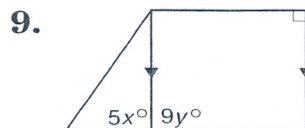
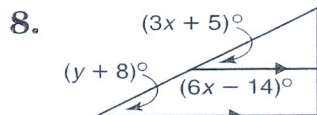


In the figure at the right  $p \parallel q$ ,  $m\angle 1 = 78$ , and  $m\angle 2 = 47$ . Find the measure of each angle.

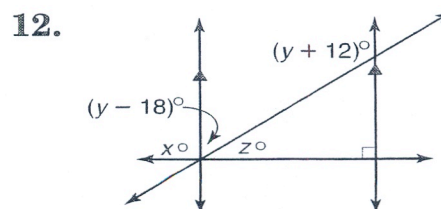
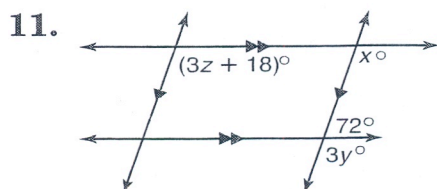
1.  $\angle 3$
2.  $\angle 4$
3.  $\angle 5$
4.  $\angle 6$
5.  $\angle 7$
6.  $\angle 8$
7.  $\angle 9$



Find the values of  $x$  and  $y$ , in each figure.



Find the values of  $x$ ,  $y$ , and  $z$  in each figure.



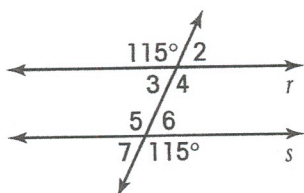
# Practice • Corresponding Angles

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## Lesson 4.7

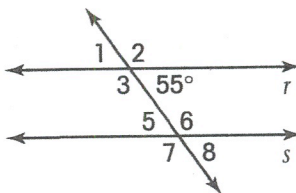
In each diagram,  $r \parallel s$ . Find the measure of each angle named.

1.



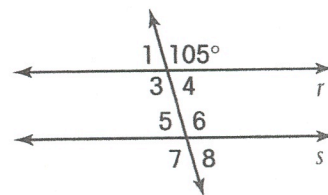
$\angle 5$  is \_\_\_\_\_.

2.



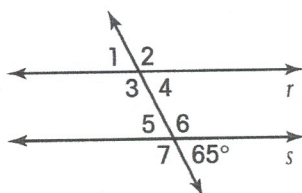
$\angle 8$  is \_\_\_\_\_.

3.



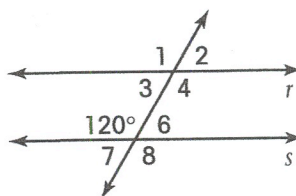
$\angle 6$  is \_\_\_\_\_.

4.



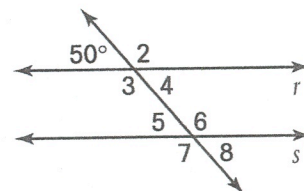
$\angle 1$  is \_\_\_\_\_.

5.



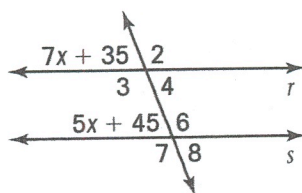
$\angle 2$  is \_\_\_\_\_.

6.



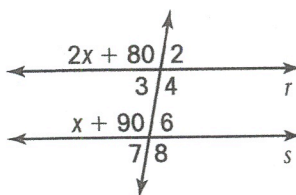
$\angle 5$  is \_\_\_\_\_.

7.



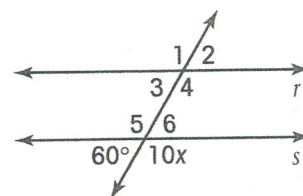
$\angle 7$  is \_\_\_\_\_.

8.



$\angle 8$  is \_\_\_\_\_.

9.



$\angle 1$  is \_\_\_\_\_.

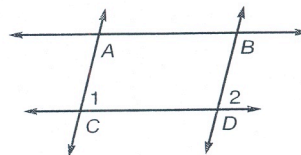
## Proving Lines Parallel

Suppose two lines in a plane are cut by a transversal. With enough information about the angles that are formed, you can decide whether the two lines are parallel.

IF	THEN
corresponding angles are congruent, alternate interior angles are congruent, alternate exterior angles are congruent, consecutive interior angles are supplementary, the lines are perpendicular to the same line,	the lines are parallel.

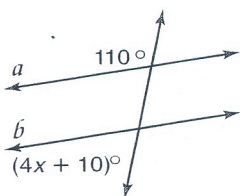
**Example:** If  $\angle 1 = \angle 2$ , which lines must be parallel? Explain.

$\overline{AC} \parallel \overline{BD}$  because a pair of corresponding angles are congruent.

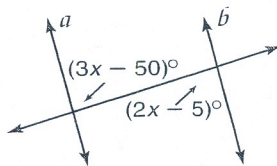


Find  $x$  so that  $a \parallel b$ .

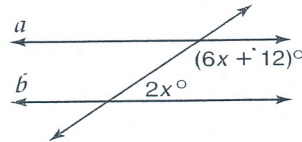
1.



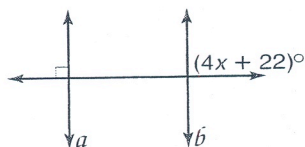
2.



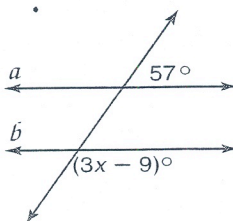
3.



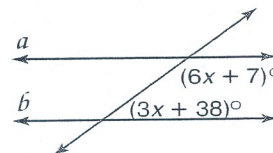
4.



5.



6.



Given the following information, determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.

7.  $\angle 1 \cong \angle 8$

8.  $\angle 4 \cong \angle 9$

9.  $m\angle 7 + m\angle 13 = 180$

10.  $\angle 9 \cong \angle 13$

